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Cost of Electricity Generation's Relationship to Population and Population Density

The popularity and increasing need for use of electronics is steadily raising the number of households that require electricity, therefore increasing the likelihood that the price of electricity will increase. Everyone needs electricity, and when demand goes up, so does cost. The cost of electricity has risen over the last decade, and it likely will not stop rising. Electricity is getting more expensive all across the US but seems most expensive in areas with greatest population density rather than simply in the most populated states.

15 MOST POPULOUS STATES OVERALL (2010 CENSUS)

State	2010 Population	Pop. Density
California	37253956	246.1
Texas	25145561	101.2
New York	19378102	417
Florida	18801310	364.6
Illinois	12830632	232
Pennsylvania	12702379	285.5
Ohio	11536504	283.2
Michigan	9883640	175
Georgia	9687653	173.7
North Carolina	9535483	202.6
New Jersey	8791894	1210.1
Virginia	8001024	209.2
Washington	6724540	104.9
Massachusetts	6547629	858
Indiana	6483802	183.4

15 MOST EXPENSIVE ELECTRIC GENERATION RATES IN 2012

State	2012 Electric Generation Cost/KWH
Connecticut	15.5
New York	15.2
New Hampshire	14.2
Vermont	14.2
Massachusetts	13.8
New Jersey	13.7
California	13.5
Rhode Island	12.7
Maine	11.8
Maryland	11.3
Delaware	11.1
Michigan	10.98
Florida	10.4
Wisconsin	10.3
Pennsylvania	9.91

STATES WITH THE 15 MOST DENSE POPULATIONS IN THE 2010 CENSUS

State	2010 Population	Pop. Density
New Jersey	8791894	1210.1
Rhode Island	1052567	1017.1
Massachusetts	6547629	858
Connecticut	3574097	742.6
Maryland	5773552	610.8
Delaware	897934	475.1
New York	19378102	417
Florida	18801310	364.6
Pennsylvania	12702379	285.5
Ohio	11536504	283.2
California	37253956	246.1
Illinois	12830632	232
Virginia	8001024	209.2
North Carolina	9535483	202.6
Indiana	6483802	183.4

Highlighted States appear in the top 15 of both most expensive generation rate and highest population density.

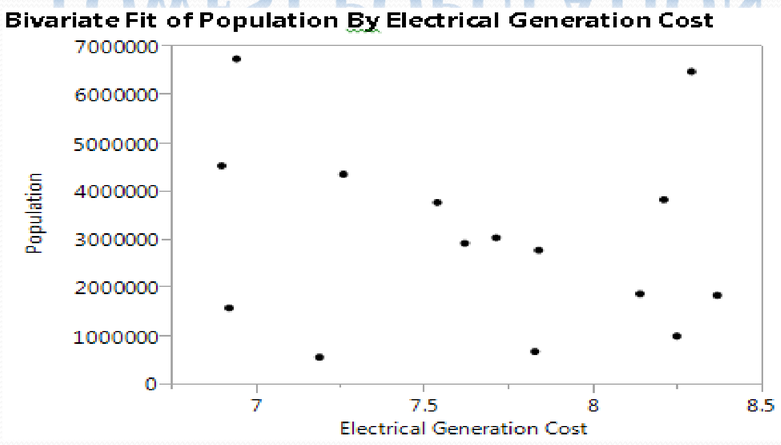
PROCEDURES

"The price of electricity is highest in places with higher population." is my hypothesis. In this case my null hypothesis would be "Population density has no effect on the price of electricity." To test this, I made two charts, one with the highest populated states and the residential electricity price per kilowatt hour, and the other with the lowest. Then I ran a bivariate analyses on both charts, because I had multiple factors related to my hypothesis, and compared my results.

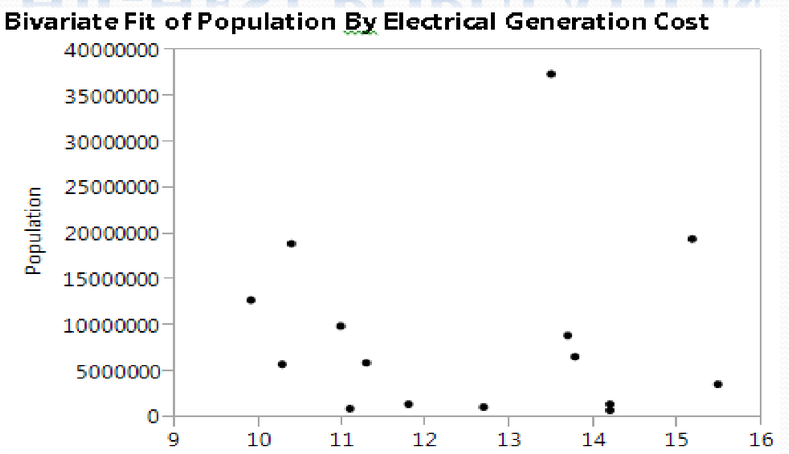
CONTIGUOUS 48 STATES SORTED BY GENERATION COST THEN POPULATION DENSITY, LARGEST TO SMALLEST:

State	2010 Population	Pop. Density	2010 Electric Generation Cost/KWH	2012 Electric Generation Cost/KWH
Connecticut	3574097	742.6	17.39	15.5
New York	19378102	417	16.4	15.2
New Hampshire	1316470	147.8	14.84	14.2
Vermont	625741	68	13.24	14.2
Massachusetts	6547629	858	14.26	13.8
New Jersey	8791894	1210.1	14.68	13.7
California	37253956	246.1	13.01	13.5
Rhode Island	1052567	1017.1	14.08	12.7
Maine	1328361	43.1	12.84	11.8
Maryland	5773552	610.8	12.7	11.3
Delaware	897934	475.1	11.97	11.1
Michigan	9883640	175	9.88	10.98
Florida	18801310	364.6	10.58	10.4
Wisconsin	5686986	106	9.78	10.3
Pennsylvania	12702379	285.5	10.31	9.91
Arizona	6392017	58.3	9.69	9.81
Colorado	5029196	50.8	9.15	9.39
Georgia	9687653	173.7	8.87	9.37
Kansas	2853118	35.4	8.35	9.33
Tennessee	6346105	157.5	8.61	9.27
Alabama	4779736	95.4	8.89	9.18
North Carolina	9535483	202.6	8.67	9.15
Ohio	11536504	283.2	9.14	9.12
South Carolina	4625364	158.8	8.49	9.1
Virginia	8001024	209.2	8.69	9.07
Nevada	2700551	25.4	9.73	8.95
Minnesota	5303925	68.1	8.41	8.86
New Mexico	2059179	17.2	8.4	8.83
Mississippi	2967297	63.7	8.59	8.6
Texas	25145561	101.2	9.34	8.55
Missouri	5988927	87.9	7.78	8.53
South Dakota	814180	11.1	7.82	8.49
Illinois	12830632	232	9.13	8.4
Nebraska	1826341	24.3	7.52	8.37
Indiana	6483802	183.4	7.67	8.29
Montana	989415	7	7.88	8.25
Oregon	3831074	40.9	7.56	8.21
West Virginia	1852994	77.1	7.45	8.14
Utah	2763885	35.3	9.64	7.84
North Dakota	672591	10.5	7.11	7.83
Iowa	3046355	55.3	7.66	7.71
Arkansas	2915918	56.9	7.28	7.62
Oklahoma	3751351	56.1	7.59	7.54
Kentucky	4339367	111.3	6.73	7.26
Wyoming	563626	6	6.2	7.19
Washington	6724540	104.9	6.66	6.94
Idaho	1567582	19.5	6.54	6.92
Louisiana	4533372	107.1	7.8	6.9

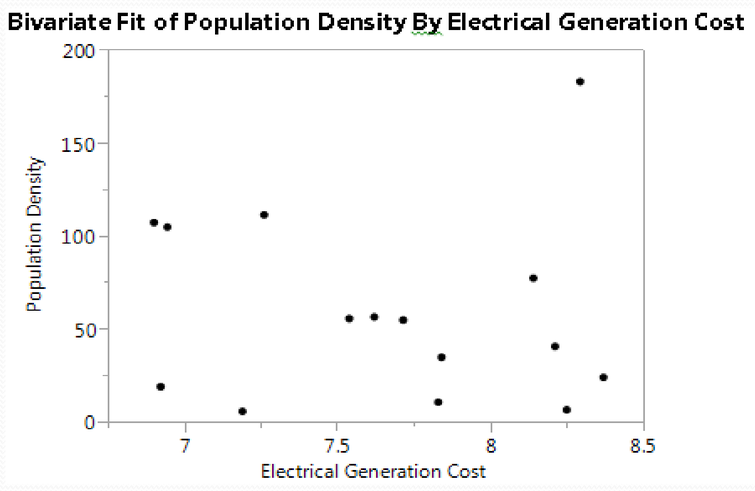
LOWEST POPULATION



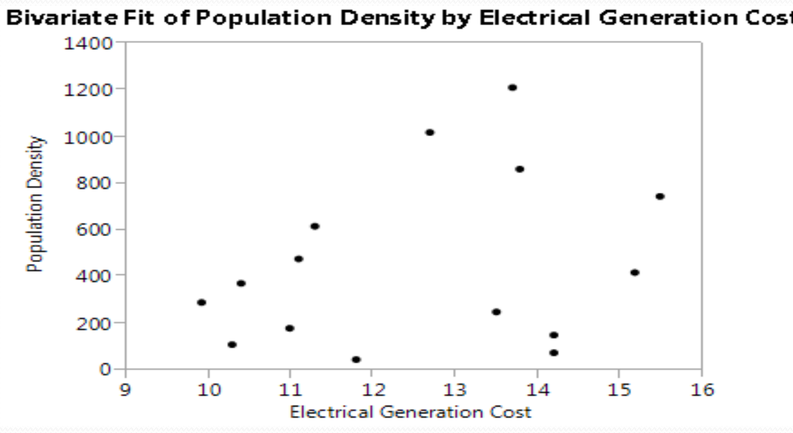
HIGHEST POPULATION



Results



Though there were a few incidents where this did not occur, my bivariate analyses generally showed that the higher a dot was, the further to the right it was. This means that the higher population (my y variable), the higher average the price of electricity (my x variable.) This means my hypothesis is true, and I would have to reject my null hypothesis



Sources

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